

United States Of America  
Department of Transportation - Federal Aviation Administration

# Supplemental Type Certificate

*Number* SA4-1100

*This Certificate issued to* Kelowna Flightcraft R & D Ltd.  
#1 5855 Kelowna Airport  
Kelowna, BC, Canada V1V 1S1

*certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part \* of the Civil Air Regulations. \*(See page 9 of this STC for certification basis)*

*Original Product Type Certificate Number :* 6A6

*Make :* General Dynamics/Convair

*Model :* 340 and 440

*Description of Type Design Change:* Installation of Allison 501-D13D, 501-D13H or 501-D22G engines and related changes in accordance with FAA Sealed Allison Convair Conversion Master Drawing List Report No. APR-100. Revision Z-137 dated March 20, 1984, or later FAA approved revision to this document is required for the "580" configuration with 501-D22G engines.

*Limitations and Conditions:* The limitations and conditions of Aircraft Specification No 6A6 apply except as outlined on pages 3 through 12 of this STC.

*This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.*

*Date of application :* August 7, 1958

*Date reissued :* 12/6/62, 10/29/84; 5/10/71;  
4/29/64; 1/20/88; 1/2/2001

*Date of issuance :* April 21, 1960

*Date amended :* January 20, 1988



*By direction of the Administrator*

*[Signature]*

(Signature)

Manager, Technical & Administrative Support  
Staff, Los Angeles Aircraft Certification Office

(Title)

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I - Convair 340 or 440 as modified by this STC ("580" configuration - see Note 11).

Engines	Two Allison 501-D13D or 501-D13H		
Fuel	Allison Specification EMS-64 (kerosene), ASTM D-1655 Jet A, Jet A-1 or Jet B, or MIL-T-5624 Grade JP-4. See Note 5 concerning additives, intermixing of fuel, and emergency use of aviation gasoline.		
Engine ratings	Takeoff (5 min.)		
	Equivalent shaft horsepower		
	501-D13D or 501-D13H dry		3,750
	501-D13H with water/methanol		3,880
	Shaft horsepower		
	501-D13D or 501-D13H dry		3,460
	501-D13H with water/methanol		3,630
	Jet thrust (lbs.)		
	501-D13D or 501-D13H dry		726
	501-D13H with water/methanol		625
	Maximum continuous		
	Equivalent shaft horsepower		3,420
	Shaft horsepower		3,138
	Jet thrust (lbs.)		705

The above ratings are based on static sea level conditions, dry air, 59°F. (501-D13D or 501-D13H dry) or 100°F. (501-D13H with water/methanol), 29.92 in. Hg. no external accessory loads, and no air bleed.

## Engine limits

Power	As measured by the torquemeter at maximum r.p.m.:		
	Takeoff (5 min.)		4,000 s. hp.
	Maximum continuous		3,400 s. hp.

RPM	13,820 r.p.m. for all operations (which corresponds to 1,020 propeller r.p.m.).		
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Turbine inlet  
Temperature

Takeoff	1,790°F.(977°C)
Maximum continuous	1,710°F.(932°C)
Transient (2 sec.)	2,040°F.(1,116°C)

Augmentation fluid  
Oil grade

Water/methanol solution (see Note 6)  
Allison Specification EMS-35 or EMS-53

Oil inlet  
temperature

Maximum	
At or below flight idle	212°F.(100°C)
Above flight idle for 5 min.	212°F.(100°C)
All other operations	185°F.( 85°C)
Minimum	
EMS-35	-25°F.(-32°C)
EMS-53	-40°F.(-40°C)

Propeller and  
propeller limits

Two Aeroproducts A6441FN-606A  
Diameter 13 ft. 6 in.  
No reduction in diameter permitted.  
Pitch settings at the 42 in. station:  
Hydraulic low pitch stop (flight idle)  $+20.0 \pm .1^\circ$   
Start  $+7.0^\circ$   
Reverse  $-4.0 \pm .3^\circ$   
Feather  $+94.9 +.1, .2^\circ$   
Beta follow-up  $31.25 \pm .75^\circ$   
Mechanical low pitch stop  $+18.25 - 0, +.25^\circ$   
Ground idle  $+1.5^\circ$   
Placard required: "Avoid Continuous Operation of  
Propellers on the Ground Below 9,900 Engine RPM for Low  
RPM Idle and Above 14,500 Engine RPM for Overspeed Fuel  
Governor Checks."  
Oil MIL-L-7870

II Convair 340 or 440 as modified by this STC ("580A" configuration - See Note 11).

Engines Two Allison 501-D22G

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Fuel

Allison Specification EMS-64 (kerosene), ASTM D-1655 Jet A, Jet A-1 or Jet B, or MIL-5-5624 Grade JP-4. See Note 5 concerning additives, intermixing of fuels and emergency use of aviation gasoline.

Engine ratings

Takeoff (5 min.)	
Equivalent shaft horsepower	4,269
Shaft horsepower	4,000
Jet thrust (lbs.)	672
Maximum continuous	
Equivalent shaft horsepower	4,243
Shaft horsepower	3,950
Jet thrust (lbs.)	732

The above ratings are based on static sea level conditions, dry air, 100°F. (takeoff) or 69°F. (maximum continuous, 29.92 in Hg, no external accessory loads, and no air bleed.

Engine limits

Power

As measured by the torquemeter at maximum r.p.m.:

Takeoff	4,000 s. hp.
Maximum continuous	3,950 s. hp.

RPM

13,820 r.p.m. for all operations (which corresponds to 1,020 propeller r.p.m.).

Turbine inlet  
temperature

Takeoff (5 min.)	1,970°F.(1,077°C)
Maximum continuous	1,850°F.(1,010°C)
Transient (5 sec.)	2,147°F.(1,175°C)

Oil Grade

Allison Specification EMS-53

Oil inlet  
temperature

Maximum	
At or below flight idle	212°F.(100°C)
Above flight idle for 5 min.	212°F.(100°C)
All other operations	185°F.( 85°C)
Minimum	-40°F.(-40°C)

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Propeller and  
propeller limits

Two Hamilton Standard 54H60/A7121B-2 or A7109B-2  
Installed in accordance with STC SA1825NM.  
Diameter 13 ft. 6 in.  
A maximum 3.25 in. reduction in diameter is permitted.  
Pitch settings – STC SA1825NM  
Oil – MIL-H-6083B Type I, MIL-H-5606 or MIL-H-82387

Alternate Propeller  
and propeller  
limits

Two Hamilton Standard 54H60-117/A7111D-2 installed in  
accordance with STC SA4-1100

Diameter 13 ft. 6 in.  
A Maximum 3.25 in. reduction in diameter is permitted.  
Pitch settings at 42 inch station:

Flight Idle (Hydraulic low pitch Stop – Top of Beta)	+17.5 ± .5°
Reverse	- 6.5 ± .1°
Feather	+92.5 ± .5°
Flight Idle (Mechanical low pitch Stop).	20 ± .5°
Ground Idle (start)	+ 5.5 ± .5°

(see Note 13 for additional data on alternate propeller).

## Data pertinent to both configurations

Airspeed limits

Never exceed ( $V_{NE}$ )

Sea level 309 knots (356 m.p.h.) IAS

10,000 ft. 313 knots (360 m.p.h.) IAS

Reduce  $V_{NE}$  6 knots per 1,000 ft. above 10,000 ft.

Maximum operating ( $V_{MO}$ )

At or below 45,000 lbs. zero fuel weight

Sea level 278 knots (320 m.p.h.) IAS

10,000 ft. 282 knots (325 m.p.h.) IAS

Reduce  $V_{MO}$  5 knots per 1,000 ft. above 10,000 ft.

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Zero fuel weight between 45,000 and 47,000 lbs.

Sea level 258 knots (297 m.p.h.) IAS

13,400 ft. 263 knots (303 m.p.h.) IAS

Reduce  $V_{MO}$  5 knots per 1,000 ft. above 13,400 ft.

Maneuvering ( $V_A$ ) - See FAA Approved Airplane Flight Manual.

Flaps extended ( $V_{FE}$ )

0 to 20° 173 knots (200 m.p.h.) IAS

20 to 30° 157 knots (180 m.p.h.) IAS

30 to 40° 150 knots (171 m.p.h.) IAS

Landing gear retraction ( $V_{LO}$ ) 146 knots (167 m.p.h.) IAS

Landing gear extension ( $V_{LE}$ ) 173 knots (200 m.p.h.) IAS

C. G. range	Gross wt. (lbs.)	Forward %MAC Sta.	Aft %MAC Sta.
Landing gear retracted	39,500 or less	8.5 360.6	35 390.9
	45,000	13.7 366.6	35 390.9
	54,600	19.27 372.9	35 390.9
	58,156	21.21 375.2	35 390.9
Landing gear extended	39,500 or less	13.0 365.8	34 389.8
	45,000	18.0 371.5	34 389.8
	52,000	21.5 375.5	34 389.8
	54,600	22.8 377.0	34 389.8
	58,156	24.6 379.0	34 389.8

Straight line variation between points given.

Datum Same as shown on Aircraft Specification 6A6.

MAC Same as shown on Aircraft Specification 6A6.

Leveling means Same as shown on Aircraft Specification 6A6.

Maximum weight

Takeoff	53,200 lbs. or 54,600 lbs. (see Note 9), or 58,166 lbs. (see Note 4)
Landing	50,670 lbs., or 52,000 lbs. (see Note 9), or



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	Zero fuel	53,000 lbs. (see Note 8) 45,000 lbs. or 47000 lbs. (see airspeed limits) All weight in excess of zero fuel must consist of fuel and oil.
Minimum crew	Same as shown on Aircraft Specification 6A6.	
Maximum passengers	Same as shown on Aircraft Specification 6A6.	
Maximum baggage	Same as shown on Aircraft Specification 6A6.	
Fuel Capacity	1,730 gal. (one 865 gal. tank in each wing at Sta. 397), or 2,032 gal. (see STC SA4-1242), or 2,058 gal. (see STC SA4-1114), or 2,908 gal. (see STC SA4-1249) (see note 1 for system fuel).	
Oil capacity	16.8 gal. at Sta. 269.6 (see Note 1 for system oil)	
Augmentation fluid capacity	13 gal. (one 21.5 gal. tank in each wing at Sta. 454)	
Maximum operating Altitude	25,000 feet	
Control Surface Movements	Same as shown on Aircraft Specification 6A6 except: Elevator trim tab (RH) - 9° up, 11° down rigged with tab Streamlined with elevator trailing edge.	
Serial numbers Eligible	2 and up (510 total airplanes eligible)	
Applicability	The approval of this change in type design applies to the basic Convair 340 or 440 airplanes that are otherwise unmodified. This approval should not be extended to other airplanes of these models on which other previously approved modifications are incorporated	

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unless it is determined that the interrelationship between this change and any of those previously approved modifications will introduce no adverse effect upon the airworthiness of those airplanes.

Certification  
Basis

Part 4b of the Civil Air Regulations effective July 20, 1950, with Amendments 4b-1, 4b-3, and 4b-5 thereto Special Civil Air Regulations No. SR-422B, Special Civil Air Regulations No. SR-423, and Special Federal Aviation Regulation No. 27. The modifications comprising the "580A" configuration were determined to be no "acoustical change" as defined by §21.93(b) of the Federal Aviation Regulations.

Production basis

None. Before an airplane modified in accordance with the provisions of this Supplemental Type Certificate is returned to service, a check of flight characteristics must be accomplished by a representative of the FAA or TCCA.

Export eligibility:

Airplanes modified in accordance with this Supplemental Type Certificate are eligible for issuance of Export Certificates of Airworthiness under the policies and procedures specified in Chapter 5 of Order 8130.2B, "Airworthiness Certification of Aircraft and Related Approvals."

Equipment:

The basic required equipment as prescribed in the applicable airworthiness regulations must be installed in the airplane for certification. PacAero Report APR-80, "Allison Prop-Jet Convair Equipment List", contains a list of all required equipment, including an FAA Approved Airplane Flight Manual, that must be installed for both the "580" and the "580A" configuration as well as optional equipment installations approved by the FAA.

Note 1. A current weight and balance report, including a list of equipment included in the certificated weight empty and, when necessary, loading instructions, must be in each airplane at the time of return to service after modification and at all times thereafter except in the case of operators having an approved weight control system.

The certificated empty weight and corresponding center of gravity locations must include the following:

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|-----------------|------------------------|
| (a) System Oil  | 86.8 lbs. at Sta. 261  |
| (b) System fuel | 57.6 lbs. at Sta. 391* |

\*Applies to basic 1,730 gal. capacity configuration. See appropriate fuel tank modification STC for data on other tank configurations.

Note 2. The following placard must be displayed in front of and in clear view of the pilot:

"This airplane shall be operated in compliance with Operating Limitations specified in the FAA Approved Airplane Flight Manual".

Note 3. Deleted.

Note 4. Airplanes modified in accordance with Pacific Airmotive Corp. Drawing No. 9000057 are approved for a takeoff weight of 58,156 lbs. when operated in accordance with the Allison Prop-Jet Convair 340/440 FAA Approved Airplane Flight Manual Supplement dated July 17, 1967. Installation of 2,908 gallon fuel capacity is required for operation at this higher weight.

Note 5. (a) Aviation gasoline, MIL-G-5572 Grade 115/145 or lower, is approved for limited emergency use. The use of Grade 80/87 (now Grade 80) gasoline is limited to the amount required to operate the engine for 1,000 hours during any overhaul period. The use of grades higher than 80/87 is limited to the amount required to operate the engine for 100 hours during any overhaul period. The average fuel consumption rate may be used to convert the allowable engine operating time to an equivalent gallonage to facilitate record keeping. Gasoline containing tricresyl phosphate, boron, or similar additives shall not be used.

(b) All approved fuels may be used separately or mixed in any proportion without adversely affecting engine operation or power output. No fuel control adjustment or system purging is required when switching fuel types.

(c) Anti-icing additives conforming to MIL-F-27686 may be used in fuels in amounts not to exceed 0.15% by volume.

(d) Shell ASA-3 antistatic additive may be used in a concentration providing no more than 300 conductivity units, which is equivalent to one p.p.m.

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- (e) Biocidal fuel additive, Biobor JF, may be used periodically in concentrations that do not exceed 270 p.p.m. Use of fuel with this additive is limited to one fueling within each engine inspection period specified in 501-D13 or 501-D22 Engine Maintenance Manual.
- Note 6. The augmentation fluid used in 501-D13H engines must be a water/methanol solution consisting of  $67 \pm 5\%$  purified water, Allison Specification EMS-120 or equivalent, and  $33 \pm 5\%$  methyl alcohol, Allison Specification EMS-125 or equivalent. The flow rate is 8 gal. per minute per engine at a pressure of 140 to 200 p.s.i.g. This permits operation at rated takeoff power with ambient temperatures above standard conditions provided other limits are not exceeded.
- Note 7. Deleted.
- Note 8. Airplanes modified in accordance with Pacific Airmotive Corp. Drawing No. 9036040 are approved for operation with Hytrol Mark 1E Anti-Skid Brake System in accordance with the Allison Prop-Jet Convair 340/440 approved Airplane Flight Manual as revised April 24, 1967.
- Note 9. Airplane modified in accordance with Pacific Airmotive Corp. Drawing No. 9000546 or Allison Prop-Jet Convair Bulletin 11-1 are approved for a maximum takeoff weight of 54,600 lbs. and a maximum landing weight of 52,000 lbs. when operated in accordance with the Allison Prop-Jet Convair 340/440 FAA Approved Airplane Flight Manual Revision dated July 17, 1967.
- Note 10. Airplanes modified in accordance with Pacific Airmotive Corp. Drawing No. 9031157 are approved for operation with a modified cabin heating and ventilation system which provides improved control and ground use capabilities with main engines shut down, an alternate inflight cabin pressurization source and 200 amperes of DC current from the APU generator.
- Note 11. Airplanes modified in accordance with this Supplemental Type Certificate are frequently referred to unofficially as "580's" or "580A's"; however, for official record purposes, these airplanes retain their original Model 340 or 440 identity.
- Note 12. Previous dates of amendment: December 6, 1962; April 29, 1964, May 10, 1971, October 29, 1984.

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Note 13. Airplanes with Allison 501-D22G engines and Hamilton Standard 54H60-77/A7121B-2 or A7109B-2 propellers (airplanes modified per STC SA1825NM) may be modified for alternate propellers, 54H60-117/A7111D-2, per FAA approved Allison Drawing 9000559, Revision C, dated January 10, 1988, or later approved revision (Allison Convair Conversion Master Drawing List Report No. APR-100, Revision Z-142 dated January 10, 1988, or latter approved revisions). The following FAA Approved Airplane Flight Manual Supplement to the basic Airplane Flight Manual, publication 1CC1-1, is required with this modification; Allison Airplane Flight Manual Supplement A, dated January 20, 1988, or later approved revision.

- END -